ATTACHMENT 1

GENERAL FACILITY DESCRIPTION

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1.0 GENERAL FACILITY DESCRIPTION [UAC R315-3-5(b)(1)]

Tooele Army Depot (TEAD) consists of 24,732 acres of federal land in north-central Utah, in Tooele County. The facility is located about 40 miles southwest of Salt Lake City, approximately 3 miles southwest of the town of Tooele, Utah.

A general site map of the installation, with a scale of 1" equals 1600', is included as Appendix A. This map shows the roads and structures and the ownership of the property surrounding the depot. With the exception of the city of Tooele, the properties immediately adjacent to TEAD are undeveloped. The properties to the north are used as pasture or are cultivated, and the properties to the west and south are used for rangeland grazing. The properties to the east of TEAD consist of the city of Tooele and undeveloped rangeland along the lower western slopes of the Oquirrh Mountains.

The principal work activities at TEAD are the shipping, receiving, and demilitarization of conventional munitions, and the testing and development of ammunition peculiar equipment and related demilitarization testing. This Permit contains the operating requirements for permitting seven HW storage facilities, a deactivation furnace (HW incineration), a small caliber munitions primer initiation unit and open burn/open detonation (OB/OD) Units. General information about these hazardous waste management units (HWMUs) is given below:

HWMU	**TYPES OF WASTES STORED/TREATED**
Permitted HW Storage (Bldg. 528)	Waste industrial chemicals: solvents, fuels, paint residues, POL, corrosives, paint removers, metal processing compounds.
PEP HW Storage (Bldgs. A101, C815, 1368) 1205, 1370, C816	Waste propellants, explosives, and pyrotechnic (PEP) materials, munitions, munition components, residues.
HW Incineration (Deactivation Furnace Bldg. 1320)	Thermal treatment of waste munitions, munitions components, and PEP materials.
Primer Initiation (Disassembly Line Building 1325)	Initiation of primers from small caliber munitions
Open Burning/Open Detonation Area	Demilitarization activities including munitions detonation in pits and propellant burning in pans.

2.0 BACKGROUND INFORMATION

TEAD's current missions include ammunition renovation, storage, demilitarization, and the design, fabrication, and testing of ammunition equipment.

The realignment of TEAD's mission to rebuild and refurbish of military equipment, by the Base Realignment and Closure (BRAC) commission, has greatly reduced the generation of hazardous paint wastes, spent solvents, and acids and bases. The generated wastes are managed and stored pending removal and transportation to a permitted hazardous waste (HW) disposal facility by a contracted permitted HW transporter.

Small arms munitions from onsite inventories that are deemed obsolete or off-specification by Department of Army (DA) standards are incinerated in the Deactivation Furnace, also known as the APE 1236 furnace. Recoverable scrap metal from incineration of these munitions is recycled through the Defense Reutilization and Marketing Office (DRMO). The ash from this operation is tested by TCLP analysis and is managed appropriately. Metal parts are determined to be free of explosive contamination by Ammunition Surveillance personnel at TEAD and are reprocessed if necessary until free of explosive contamination.

The OB/OD Area is located in the southwestern corner of TEAD and consists of a detonation unit, a static fire unit and a burn pan unit. The OB/OD Units have been used since the 1940s for demilitarization activities including munitions detonation in pits and propellant burning in pans. Past activities included burning munitions and other items in open trenches. Trenches were backfilled when they became full. Burning is no longer conducted in open trenches. There are currently 19 detonation pits, fifteen burn pans and six static silos at the OB/OD Area. Figure 1 is a map showing the location of the OB/OD Area at TEAD and Figure 2 is the detailed map showing the OB/OD operations area. Detailed drawings of the units are in Appendices C, D and E.

3.0 CORRECTIVE ACTIONS

TEAD is on the CERCLA National Priorities List (NPL) and entered into a Federal Facilities Agreement (FFA) with EPA Region VIII and the Utah Department of Environmental Quality (UDEQ) in September 1991. Seventeen of the 58 known and potential waste sites at TEAD were designated as CERCLA sites in this agreement.

In January 1991, TEAD was issued a RCRA Post Closure and Corrective Action Permit. This permit basically serves the same purpose as the FFA. The Corrective Action portion of the Permit addresses 9 known release Solid Waste Management Units (SWMUs) and 32 suspected release SWMUs. Thus, 17 of the 58 sites are being handled under CERCLA/SARA with the EPA as the lead regulatory agency and 41 are being addressed under RCRA with the state of Utah as the lead agency. The FFA has been incorporated into the *TEAD North Area Industrial Waste Lagoon Post-Closure Permit.* Further information about the SWMUs and corrective actions can be found in the latest version of the TEAD Installation Action Plan.

Figure 1. Location of OB/OD Units at TEAD

Figure 2. Operation Area of OB/OD

4.0 SEISMIC STANDARD UACR315-8-2.9(a); R315-3-5(b) (11)]

The HWMUs at TEAD are existing facilities and as such are exempt from the provisions of UAC R315-8-2.9(a)(b).

5.0 FLOODPLAIN STANDARD [UAC R315-8-2.9(b); R315-3-5(b)(11)]

No Flood Insurance Administration (FLA) 100-year floodplain maps of the TEAD facility exists. However, TEAD has been determined to be outside of the 100-year flood plain and not subject to flooding based on the following information extracted from the *TEAD Master Plan Report*prepared by Higginbotham and Associates, P.C., and the *Installation Assessment* prepared by the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA):

- There is no history of flooding at TEAD during the 45 years that it has been in existence.
- The overall drainage gradient for the entire TEAD facility is 2% or greater, and this grade continues for many miles. The topography is generally smooth and uniform, allowing no chance for ponding or pooling of floodwaters.
- No channels exist that would concentrate flows from upgradient areas.
- Few well-defined channels exist in the vicinity of TEAD. There are none that would carry or direct water to or through any of the HWMUs.
- TEAD facilities are 300 feet higher in elevation than the Great Salt Lake, the ultimate drainage for the area.
- The drainage gradient to the Great Salt Lake is smooth and uniform. The lake is approximately eight miles from TEAD.
- There are no onsite barriers to impede runoff. No significant vegetation exists to retain runoff waters.
- The area is arid to semiarid and receives little precipitation. The 100-year 24-hour precipitation event is less than 3.2 inches.
- The soils of the area are generally very pervious. Thus, little runoff is expected.

Topographic Maps for each HWMU, required by UAC R315-3-5(b)(19) are included in this facility description as Appendix B. Two wind roses, showing prevailing wind direction and speed, are shown in Figures 3 and 4.

6.0 TRAFFIC PATTERNS [UAC R315-3-5(b)(10)]

The highway network map, Figure 5, shows the major highways serving the TEAD area. State Highway 36 runs from the southwest to the northeast, adjacent to the southeast corner of TEAD.

Figure 3. Wind Rose, TEAD

Figure 4. Salt Lake City Wind Rose

Figure 5. Highway Network Map

State Highway 112 runs from the northwest to the southeast, adjacent to the northeast corner of TEAD. State Highway 59 runs from the north to the south along the western boundary of TEAD.

Primary entry routes to TEAD are by way of the Main Entrance Road to State Highway 36 and the North Gate Approach Road of State Highway 112. The Main Entrance Road serves as the major traffic corridor. These local roads are shown on the General Site Map, Appendix A.

Traffic patterns related to the HWMUs are shown in Figure 6. Generally, all traffic, including government, commercial, and private vehicles, follows the primary traffic routes.

7.0 TRAFFIC CONTROL

Stop signs are positioned at most intersections to control the flow of traffic in the more congested areas of the installation. Traffic lights are located at the main entrance gate. Security personnel are authorized to enforce traffic regulations and provide traffic control when required. Arterial roads are constructed with the magazine areas to service maintenance and storage facilities. These roads are of standard two-lane configuration with speed limits ranging from 10 to 45 mph, depending on congestion and road conditions such as curves, surface types, and visibility.

8.0 ESTIMATED TRAFFIC VOLUME

It is estimated that up to 600 vehicles belonging to employees and contractors, are driven onto the installation each workday. Most trips driven on the installation by employees are made in government vehicles. There are around 50 government (GSA) high capacity trucks and about 210 pickup trucks, vans, and sedans. These vehicles are used approximately 5 hours per day. About 60 engineering construction vehicles are also in use in varying degrees. Additionally, about 115 material handling equipment vehicles, forklifts, etc., are frequently driven on the installation's roads.

9.0 ROAD SURFACING AND LOAD BEARING CAPACITY

All arterial and major access roads at TEAD are designated for a minimum bearing load capacity of 18,000 pounds per axle. Construction materials for road surfaces along main access routes and arterial roads to the operations and storage are asphalt/concrete, bituminous, or gravel. Secondary road surfaces are earthen. Table 1 gives design details for TEAD roads by class.

10.0 HAZARDOUS WASTE STORAGE AND VARIANCE

TEAD does not treat nonreactive waste at the OB/OD Units other than incidental packaging. Thus a variance to treat solid waste is not needed.

Currently TEAD does not accept waste from off site for treatment at the OB/OD Units except from Deseret Chemical Depot (DCD) and the 62nd Ordnance Group. Munitions are treated the same day, weather permitting, that they are received at the OB/OD Units. In the case of weather delays, munitions are treated as soon as possible (generally within 24 hours) There is an occasional need for the

Figure 6. Hazardous Waste Traffic Routes

overnight storage of munitions in the pits on an emergency basis. TEAD obtains emergency storage permits if explosive wastes in operable units are not treated within 24 hours.

11.0 TOPOGRAPHIC MAPS

Maps, presented in Appendix B, illustrate the general topography of each HWMU, including the OB/OD Units. In addition, as required by various subsections of UAC R315-3-5(19), figures are included to illustrate the following:

- Surface Water: Figure 7 shows the general surface water drainage at TEAD. Also see Attachment 19 for a detailed discussion of surface water.

- Land Use: Figures 8 through 10 show land use at and surrounding TEAD.

Most of the land around TEAD is agricultural, being used for livestock grazing and limited cultivation. Areas of low to moderate intensity development are located in the city of Tooele, east of TEAD. The community of Grantsville abuts TEAD on the northwest, although the closest urban development is about two miles away from the facility. The small community of Stockton is about two miles south of TEAD along SR 36.

TEAD is bounded on the north by SR 112. Except for the Tooele County Landfill and a salvage company, land north of this road is grazed or farmed. The Union Pacific Railroad's main line (Salt Lake City to Los Angeles) cuts along the east side of the depot. The city of Tooele Commercial Park lies to the east along with some residential areas. The main entrance to TEAD is via SR 36, which skirts the southeast side of the depot. Land to the south and west of TEAD is used mainly for livestock grazing. Figures 8 and 9 indicate zoning of lands surrounding the BRAC parcel and TEAD.

TEAD is adjoined by three land uses: low-density residential, industrial/manufacturing, and agricultural. Property west and south of TEAD is controlled by the U.S. Forest Service, the U.S. Bureau of Land Management (BLM), or Tooele County and is designated by Tooele County for multiple uses (MU-40), including agricultural, grazing, and mining. MU-40 zoning is intended to minimize public utility and service expenditures (which could result from urban sprawl) and to promote the preservation of local watersheds and wildlife habitats. Zoning designations on the northern boundary are either rural residential (RR1), allowing low-density family dwellings units and limited domestic livestock habitation, or agricultural (A-20) which promotes the preservation of favorable agricultural land and maintains greenbelts.

All zoning controls surrounding TEAD are imposed by Tooele County under the Standard State Zoning Enabling Act.

Figure 7. Surface Water at TEAD

Figure 8. Current Land Use at TEAD - Industrial Area

Figure 9. Current Land Use at TEAD - Administrative Area

Figure 10. Regional Land Uses Surrounding TEAD

12.0 OB/OD DESIGN AND OPERATION

12.1. Applicability as a Miscellaneous Unit [UAC R315-8-16 and R315-8-6.8]

TEAD conducts thermal treatment of conventional energetic material items at the OB/OD Area. The principal work activities at TEAD are the shipping, receiving, maintenance and demilitarization of conventional munitions, and the testing and development of ammunition peculiar equipment and related demilitarization testing. The location of the OB/OD Area is shown in Figure 1. Treatment by OB/OD falls under the miscellaneous units provisions in UAC R315-8-16.

OB/OD is used for treatment of energetic materials because this is the only safe and effective treatment process currently available for most energetic material items. The selection of OB/OD is based on energetic material item-specific information developed by the U.S. Army based on energetic material type and content, explosion potential, and historical experience. As discussed in Attachment 21, the U.S. Army is continuing to study and evaluate alternative treatment processes that may be used in the future, rather than OB/OD, to treat appropriate energetic materials.

Because the OB and OD treatment processes are a noncontinuous (i.e., batch) process, the facility is not subject to steady-state or "normal" operating conditions. Wastes are treated by the Demil Team according to Standard Operating Procedures (SOPs). The SOPs detail the handling of the explosives from storage to unloading, the tools to be used, setting the charge, and, ultimately, burning or detonation.

There are major advantages for using OB and OD disposal practices. These include the following:

- Safety. Safety is the most important consideration. Strict observance of proven OB and OD procedures has resulted in an excellent safety record being earned by the personnel who have helped to treat the many millions of pounds of waste military energetic materials safely over the last four decades at numerous Department of Defense (DOD) installations.

- Versatility. These types of operations are extremely versatile; large or small quantities of the myriad types of materials can be treated easily and safely.

- Reliability. Because of their inherent simplicity, OB and OD are extremely reliable processes not subject to equipment downtime.

- Treatment Efficiency. Both OB/OD are very efficient treatments as demonstrated by testing. This is discussed in further detail in Attachment 21.

12.2 Open Burn (OB)

12.2.a Appropriateness of Treatment Technology [UAC R315-3-23(b)]

The reasons that OB is an appropriate treatment technology for unserviceable munitions are discussed in Attachment 21.

12.2.b Description of OB Unit [UAC R315-3-6.8(a)]

OB occurs at the OB unit. The OB unit is about 200 feet directly south of the OD unit. Figures in Appendix C show the burn pans at the OB Unit. Treatment at the OB unit is accomplished by the use of 15 burn pans. Items typically treated are bulk propellants. No donor charges are used in OB.

Twelve of the 15 burn pans are designed and constructed similarly. The dimensions of each of the 12 pans are approximately 16 ft x4 ft x 11 inches deep. The other three burn pans are of varying sizes. A schematic of a typical burn pan is provided in Appendix C. Appendix C also has the detailed drawings of the burn pans used at TEAD. The burn pans are approximately 60 feet apart. Each pan is elevated approximately 1 foot. The position of the legs of the structure allows for easy inspection of the bottom of the pan and the surface of the ground beneath it. The pans are constructed of steel, and covers are placed over them when they are not in use.

Prior to conducting OB, certain meteorological conditions must be met. Figure 11 lists the meteorological parameters for TEAD. The Demil Team Leader, or his/her designated representative, must ensure that all firing has ceased when aircraft approach the area. Designated observers have effective communications with the Range Supervisor any time an aircraft approaches the area. OB is not initiated until 1/2-hour after sunrise and is concluded 1/2-hour before sunset. Meteorological data are obtained from the:

- Salt Lake City National Weather Services; or
- Internet (http://nimbo.wrh.noaa.gov/saltlake/).
- www.accuweather.com
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An on-site met tower provides site-specific data. A determination is made prior to burning whether to cease operations or to continue based on the meteorological data. This information is recorded on a form. The demil operations are determined “GO” or “NO GO” by weather forecasts as described above. When forecasts indicate a “GO” condition, demil operations proceed. However, if the weather conditions deteriorate as observed by the Demil Team Leader or his/her designated representative for the operation, he/she contacts the Demil Planner. A determination is made whether to continue the operation with the propellant already in the pan or to leave the propellant in the pan and burn it the following day. If the propellant is held over until the next day, the Environmental Management Office is notified so that it can brief the Executive Secretary about why the materials were left unburned. Under no circumstances is propellant placed in the pan after weather conditions have deteriorated.

Figure 11. Meteorological Parameters for TEAD

Parameters	TEAD Requirement
Wind speed for burn and static fire	3-20 mph/gusts to 30 mph
Wind speed for detonation	3-15 mph/gusts to 20 mph
Cloud cover (see note)	<80%
Ceiling	>2,000 ft.
Precipitation	<75% chance
Thunderstorm/electrical storm	<50% chance
Clearing index	>500
Visibility	1 mile

Source: TEAD Regulation 385-2, AMC Regulation 755-8.
Note: Cloud cover and ceiling limits are in conjunction with each other. Operations shall not be carried out when the cloud cover is greater than 80% and the cloud ceiling is less than 2,000 ft.

Change:_____ Date: _____

The Demil Planner annotates on the Demilitarization Approval Form that each organization has been notified. The Demil Planner takes this Demilitarization Approval Form to the Directorate of Ammunition Operations or his/her designated representative for approval/disapproval The Demil Planner phones the Demil Team Leader to inform whether the mission has been approved /disapproved. The Demil Team Leader phones the Demil Planner to describe when charges have been set and when they are ready to burn.

The preliminary steps prior to the actual OB activities are similar to those for the OD practice. Dry grass, leaves, and other extraneous combustible material in amounts sufficient to spread fires are removed within a radius of 61 m (200 feet) from the pans. Meteorological data are checked, and trays are arranged so that the propellants burn in the opposite direction from which the wind is blowing. Telephone or two-way radio communications are established and remain in operation during the entire OB operation.
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The propellant to be burned is loaded into the pans. The propellant is poured into the pans with extreme care taken to prevent the occurrence of spills. The propellant is placed in the pan to a thickness no greater than 7.5 cm (3 in.). The area is then cleared of all personnel except for those needed to install the igniting charge into the pans. When the area is determined to be clear, the igniting charges are laid in the pans and activated.

The burn operation is observed from a safe position, and fire-fighting equipment is made available to combat grass, brush, or equipment fires. Qualified personnel check pans and ensure that all propellant has been burned. At the end of each day's operation, all extraneous operations materials are removed from the OB unit. Ash and residue are gathered, containerized in an authorized container, labeled as hazardous waste, and stored.

The Demil Team operates the OB unit in accordance with Standard Operating Procedure (SOP) No. TE-0000-H-012. This SOP provides additional information on current procedures.

12.2.c. Leak Detection Provisions [Utah Code R315-3-6.8(a)(1) and (2)]

This section addresses the concern that ash/residue or wastes may be released from the burn pan if it develops a leak, a break, or a crack. The potential for such a release is minimized through pre-burn and post-burn inspections of burn pan integrity. The burn pan is situated above ground on two I-beams to allow visual inspection for leaks. The use of I-beams facilitates the conduct of routine integrity inspections of the burn pans.

Any pan showing any evidence of deterioration is not used; and damaged pans are repaired prior to being returned to use. Additionally, the structural integrity of steel pans has been shown to be reliable in previous U.S. Army tests at the Tooele Army Depot. The results of these tests are contained in Appendix D.

There is no need to construct secondary containment in the OB unit to be fully protective of the environment. Any ejecta is collected during the post-burn inspection and is reburned the same day. The pan design has been tested and shown to be structurally reliable. In addition, any damage to the pan would be detected during pre-burn and post-burn inspection and repaired before the pan is used again.

12.2.d. Precipitation Cover [Utah Code R315-3-6.8(a)(1) and (2)]

Each burn pan is equipped with a precipitation cover. The covers are tight fitting and remain on the burn pans during non-operational periods to prevent accumulation of precipitation and wind dispersion of any ash and residue.

12.2.e Control of Releases of Ashes and Residues During OB [Utah Code R315-3-6.8(a)(1) and (2)]

This section addresses the concern that the propellant, waste, or ashes will be ejected from the burn pan onto the ground during burning operations, potentially resulting in environmental contamination via the soil, surface water, and groundwater pathways. This potential for contamination is minimized during OB by several measures. First, the burn pan is of sufficient height to minimize the ejection of most waste. Second, post-burn inspection of the area surrounding the pan would reveal the presence of ejected materials, which are subsequently collected. A determination is made as to whether there is any remaining contamination by having experienced personnel carefully inspect the pans and the surrounding area after a burn.

It is considered unsafe to approach the burn pan for ash removal and inspection until a sufficient time has passed to allow all materials in the pan to cool. The pan is inspected after a burn to make sure that all the propellants have burned and the pan is then covered. Any visible ejecta from the pan are collected and placed back in the pan. Although every effort is made to pick up visible ejecta, it is possible that some very small particles may escape detection. After OB, pans are inspected, and any ash is collected and temporarily stored in appropriate containers at the SAA. When the container is full, a composite sample is collected and analyzed. Full containers will be removed within 3 days to a 90-day permitted facility.

12.2.f. Methods to Control Deterioration of Fabricated Devices [Utah Code R315-3-6.8(a)(1) and (2)]

As stated in UAC R315-8-7, *The owner or operator must remedy any deterioration or malfunction of equipment or structures which the inspection reveals on a schedule which ensures that the problem does not lead to an environmental or human health hazard.* The most serious deterioration or malfunction during OB would be loss of burn pan integrity such as a burn pan leak. However, routine pan integrity inspections are conducted prior to and after each OB treatment event. In the event of an accidental release of waste propellants before or during a burn event, the released waste materials will be collected and re-treated in a different burn pan. Specific response procedures are established and are contained in Attachment 7. Procedures to prevent hazards are discussed in Attachment 6.

12.2.g. Prevention of Accumulated Precipitation Within Burn Pans [UAC R315-3-6.8(a)(1) and (2)]

Accumulation of precipitation within the burn pan could provide a means of release of ash or waste to the environment and could also prevent complete thermal treatment of the waste. Precipitation accumulation in the burn pan during non-operational periods is prevented through the use of a precipitation cover. Covers are tight fitting, are secured in place over the pans, and remain on the pans during nonoperational periods. Precipitation accumulation in the pan during OB events and cooldowns is minimized by conducting OB events only at times when precipitation is not expected. OB treatment operations are not conducted during low overcast sky (i.e., cloud cover of 80% or more and cloud ceiling of less than 2,000 feet) and during precipitation or forecasted high probability of precipitation (greater than 75%). For obvious reasons, the covers cannot be used during OB operations. Following a waiting period (based on safety considerations) after the burn, the pan is inspected and its cover replaced.

If water has accumulated in the pans, it is drained out into an appropriate container prior to a burn. The drained water is sampled by Environmental Management Office personnel and placed into hazardous waste storage until analysis can be reviewed to determine the correct disposition of the water.

12.2.h. Handling of Precipitation Accumulated in Fabricated Devices [UAC R315-3-6.8(a)(1) and (2)]

Although it is highly unlikely, TEAD recognizes that precipitation may contact the ash while the ash is in the burn pan prior to being removed. In such cases, the precipitation is removed with the ash and is considered part of the waste.

12.2.i. Controls to Prevent Wind Dispersion of Ash and Other Residue

Certain administrative controls are used to protect human health and the environment. These include controls to prevent wind dispersion of ash and other residue, such as operating only during moderate wind speeds (i.e., greater than 3 mph to less than 20 mph) to reduce the potential of fugitive particulate emissions. The propellants are generally in the form of pellets, and other energetic materials are contained in casings. Thus, wind dispersion of these energetic wastes is not a problem. The high walls of the burn pan minimize the potential for fugitive wind erosion of these materials.

The cover of the burn pan is replaced after completion of the burn (after a wait time for safety reasons). In addition, the high sides of the burn pan reduce the potential for wind erosion during pre- and post-burn conditions when the cover is off. EPA has reported the efficiency of barriers with a 50% porosity

to control wind-blown dust to range from 0% to about 90% based on limited tests (USEPA, 1988c). The zone of protection provided by test wind barriers was approximately 10 times the barriers' height. Solid barriers that have a 0% porosity (such as the sides of the burn pans at TEAD) are expected to provide an even greater control efficiency.

12.2.j. Inspection, Monitoring, and Maintenance [UAC R315-3-6.8(a)(1) and (2)]

The OB unit is inspected before and after use. Prior to use, the OB unit is inspected to ensure that:

- The burn pans do not have cracks, holes, or other leak sources, and
- The immediate area is free of excess vegetation or other potentially combustible material.

After OB activities are completed, the burn pans are inspected for partial burns. If unburned material is discovered, it is subsequently re-burned, provided the pan is safe. Otherwise, re-burning operations are delayed overnight. See Attachment 4 for inspection procedures that are used.

12.2.k Standing Operating Procedures [UAC R315-3-6.8(a)(2)]

All OB activities at TEAD are conducted by the Demil Team. As discussed above, all Demil personnel are required to comply with SOP No. TE-0000-H-012. The SOP prescribes the responsibilities, policies, and procedures for the operation of the OB unit. This SOP will be amended, as necessary, to reference and be consistent with all conditions of RCRA.. The SOP retains the environmental performance standards specified in this permit.

The Demil office maintains the official file for all treatment activities in the OB unit. As stated in Attachment 2, ash residue analysis results will be maintained by the Environmental Management Office.

12.3. OPEN DETONATION [UAC R315-3-6.8(a)(8) and R315-3-23]

12.3.a. Appropriateness of Treatment Technology [UAC R315-3-23(b)]

See Attachment 21 for Alternative Treatment Technologies and Waste Minimization.

12.3.b. Description and Operation of OD Unit [UAC R315-3-6.8(a)]

The OD pits are in the southwestern corner of the TEAD. The entire OB/OD Area is approximately 780 acres. OD is conducted in 19 pits. These pits are numbered 1 through 19. The figures in Appendix E show the location of the pits in relation to the static fire silos and burn pans. The area is a broad dissected alluvial fan emanating from the Stansbury Mountain. OD is conducted in subsurface pits that are covered with native soil. The depth of the pits is determined by the quantity of munitions treated. There are no engineered features at this OD unit to detect or prevent releases. Due to the nature of OD, engineered features could be destroyed by detonation.

Prior to conducting OD, certain meteorological conditions must be met. Acceptable meteorological conditions for conducting OD are indicated in Table 4 and in the SOP. OD is not initiated until at least 1/2 hour after sunrise and is concluded at least 1/2 hour before sunset, with wind speeds greater than 3 miles per hour (mph) and less than 15 mph with gusts less than 20 mph, and not during or immediately prior to the approach of any electrical storms, snowstorms, or other precipitation events. Meteorological data may be obtained from the Salt Lake City National Weather Service, and the Internet.

The Demil Team Leader or his/her designated representative ensures that all firing has ceased when aircraft approach the area. Designated observers have effective communications with the Range Supervisor any time an aircraft approaches the area. OD will not be initiated until 1/2-hour after sunrise and is concluded 1/2-hour before sunset. Meteorological data are obtained from the

- Salt Lake City National Weather Services; or
- Internet (http://nimbo.wrh.noaa.gov/saltlake/)
- www.acuweather.com

An on-site met tower provides site-specific data. A determination is made prior to detonation whether to cease operations or to continue based on meteorological data. This information is recorded on a form. The demil operations are determined "GO" or "NO GO" by weather forecasts as described above. When forecasts indicate a "GO" condition, demil operations proceed. However, if the weather conditions deteriorate, as observed by the Demil Team Leader, or his/her designated representative, he/she contacts the Demil Planner. A determination is made whether to continue the operation with the ammunition already in the pit or to leave the ammunition in the pit and detonate it the following day. If the ammunition is held over until the next day, the Environmental Management Office is notified so that it can brief the Executive Secretary about why the munitions were left undetonated. Under no circumstances is ammunition placed in the pit after weather conditions have deteriorated.

The Demil Planner will annotate on the Demilitarization Approval Form that each organization has been notified. The Demil Planner takes the Demilitarization Approval Form to the Directorate of Ammunition Operations or his/her designated representative for approval/disapproval. The Demil Planner phones the Demil Team Leader to inform whether the mission has been approved or disapproved. The Demil Team Leader phones the Demil Planner to tell when charges have been set and when the team is ready to detonate.

The design elements that are used to provide protection of human health and the environment include: using appropriate burial depth depending on treatment quantity; burying the munitions to appropriate depths; locating the OD unit far from public roads and inhabited housing; limiting the treatment amounts to 750 lbs NEW per pit, per event. (including donor) ; only treating appropriate reactive materials; re-treating any unexploded ordnance (UXO); operating only during appropriate weather conditions; and restricting access to the unit by the use of warning signs, gates, and a surveillance team.

TEAD is limited to the pit explosive limits specified in Condition VI.B.4. and Table 2 (SOP No. TE-0000-G-010) for the 3.5-in. rocket frag munitions. Any additional munitions are considered on a case-by-case basis for explosive limits. If it is determined that the munitions are of greater explosive quantity or different type, additional tests will be conducted to determine debris/fragment throw range. A 20% factor is added to the maximum throw range as a safety factor.

Earth cover for the TEAD detonations is also specified in SOP No. TE-0000-G-010. Requirements are as follows:

- 0-50 lbs. NEW (including donor) requires no earth cover
- 51-750 lbs. NEW (including donor) requires 15 feet of earth cover.

TEAD OD SOP No. TE-0000-G-010 also specifies the distances that are required from above-ground (unburied) detonations to unprotected personnel. This is specified in Table 3. If the OD materials are buried, Table 4 is used. In lieu of the formula specified in Table 3, column A of Table 4 may be used for above-ground detonations. If the materials to be detonated are buried, the reduced distance provided by columns B through I of Table 4 can be used.

Prior to conducting OD operations, as in OB operations, dry grass, leaves, and other combustible materials are cleared within a 61 m (200 ft) radius from the pits.

The placement of the initiating charges and the amount of initiating charge are determined by the amount and nature of material being treated and are specified in Army manuals. Munitions are detonated by either non-electrical or electrical methods. The only residues generated as a result of OD operations are metallic materials such as shell fragments (shrapnel) and occasionally pieces of energetic materials or UXO that were not completely treated during OD. The OD unit is inspected for these materials following OD. After each day of detonation operations, a search of the surrounding area is made for unexploded munitions. Items or material such as lumps of explosives or unfuzed ammunition may be picked up and prepared for the next detonation. Recovery and detonation of fuzed ammunition or suspected live munition items are treated in accordance with SOP No. TE-0000-G-010. All items or material (fuzed, unfuzed, and live munitions) found must be detonated within two working days of the time they are recovered or put into permitted storage until they are detonated.

Analysis of the OD treatment residue is not conducted at TEAD. TEAD periodically recovers scrap metal, casing, fragment, and related items from the OD grounds as resources allow, and based on the Demil Team Leader's judgment regarding safe operation of the range. The recovered material is disposed of through the Defense Reutilization Marketing Office (DRMO). The Demil team will inspect and document the recovered material to ensure it is explosive free. The Ammunition Surveillance Inspector will verify the documentation. Management of ash and residues is discussed further in Attachment 2.

The munitions are on pallets that are transported to the OD pit via forklift or roller conveyor. The palletized munitions are positioned in such a manner to ensure complete detonation. The palletized munitions requiring unpacking are removed to the unpack operation near or within the demolition pit using a forklift. A minimum of 10 feet of separation is maintained between unpack operations and materials stacked in the OD pit. Information about the specific item being treated is used to determine appropriate treatment. For example, bombs and mortar projectiles are as much as 80% (by weight) explosives and have relatively thin walls, as compared with artillery shells, which are 10 to 15% explosives and have relatively heavy walls. The Demil Team personnel maintain an extensive collection of Army Technical Manuals to provide guidance on appropriate OD procedures for specific items (e.g., Technical Manual - Ammunition and Explosives Standards, TM 9-1300-206, Headquarters, Department of the Army, August 1973).

Table 1. Road Design Standards

Table 2. TEAD explosive limits for the 3.5-in. rocket fragment munitions

Pit no.	Distance boundary	Non frag	Less than 5”	Untested 5” or greater	Tested 5” or greater
1	2912 Feet	750 lbs	750 lbs	0 lbs	750 lbs
2	2992 Feet	750 lbs	750 lbs	0 lbs	750 lbs
3	3091 Feet	750 lbs	750 lbs	0 lbs	750 lbs
4	3194 Feet	750 lbs	750 lbs	0 lbs	750 lbs
5	3168 Feet	750 lbs	750 lbs	0 lbs	750 lbs
6	3141 Feet	750 lbs	750 lbs	0 lbs	750 lbs
7	3115 Feet	750 lbs	750 lbs	0 lbs	750 lbs
8	3058 Feet	750 lbs	750 lbs	0 lbs	750 lbs
9	3000 Feet	750 lbs	750 lbs	0 lbs	750 lbs
10	2945 Feet	750 lbs	750 lbs	0 lbs	750 lbs
11	2879 Feet	750 lbs	750 lbs	0 lbs	750 lbs
12	2814 Feet	750 lbs	750 lbs	0 lbs	750 lbs
13	2745 Feet	750 lbs	750 lbs	0 lbs	750 lbs
14	2676 Feet	750 lbs	750 lbs	0 lbs	750 lbs
15	2608 Feet	750 lbs	750 lbs	0 lbs	750 lbs
16	2521 Feet	750 lbs	750 lbs	0 lbs	750 lbs
17	2348 Feet	750 lbs	0 lbs	0 lbs	0 lbs
18	2213 Feet	750 lbs	0 lbs	0 lbs	0 lbs
19	2362 Feet	750 lbs	0 lbs	0 lbs	0 lbs

Table 3. Distances from above-ground detonations to unprotected personnel

Material to detonate	Blast distance	Fragment/debris
Non-frag explosive material	D = 328 W**1/3	1,250 feet
Bombs and projectile with a diameter less than 5 inches	D = 328W**1/3	2,500 feet
Bombs and projectiles with a diameter of 5 inches or more	D = 328W**1/3	4,000 feet
All other ammunition	D = 328W**1/3	2,500 feet

Table 4. Required blast overpressure protection distances to nonessential personnel*

NEW in lbs.	Distance in feet for various burial depth								
	0 FT COL A	1 FT COL B	2 FT COL C	3 FT COL D	4 FT COL E	5 FT COL F	7 FT COL G	10 FT COL H	15 FT COL I
1	328	79	16	16	16	16	16	16	16
5	561	261	104	41	28	28	28	28	28
10	707	398	191	92	44	35	35	35	35
20	890	464	326	182	102	57	45	45	45
30	1019	566	368	260	157	94	51	51	51
40	1122	650	439	329	208	131	62	56	56
50	1208	721	501	349	255	166	71	60	60
100	1522	984	737	553	414	326	165	76	76
150	1743	1171	911	708	550	428	256	105	87

*Required Blast Overpressure protection distances to nonessential personnel from ranges used for detonating ammunition for the purposes of demilitarization, demonstration, or explosives ordnance disposal.

12.3.c. Monitoring, and Maintenance Plan [UAC R315-3-6.8(a)(2)]

The OD area is inspected before and after use. Prior to any detonation operations, the OD pits are inspected to ensure that they are:

- Free of water
- Free of ordnance fragments, UXO, blasting caps, detonation cords, or other OD operational debris
- Free of glass, wood fragments, metal scraps, and debris, trash, obstacles, or tripping hazards
- Free of plant matter or other potentially combustible material.

As stated earlier, OD is a very efficient method of treatment; very little shrapnel remains in the OD unit. After each day of detonation operations, a search of the surrounding area is made for unexploded munitions. Items or material such as lumps of explosives or unfuzed ammunition may be picked up and prepared for the next detonation. Recovery and detonation of fuzed ammunition or suspected live munition items are treated in accordance with SOP No. TE-0000-G-010. All items or material (fuzed, unfuzed, and live munitions) found must be detonated within two working days of the day they are found, or put into permitted storage until they are detonated.

12.3.d. Runon and Runoff Management [UAC R315-3-6.8(a)(2)]

The process of OD disrupts several feet of soil. The modeling results from the Multimedia Environmental Pollutant Assessment System (MEPAS) indicate that, with several conservative and worst-case assumptions, the concentrations estimated for groundwater leaching, overland runoff, surface water recharge, and atmospheric deposition are of lesser magnitude than the health-based levels for constituents of concern.

Precipitation does not contact the waste during OD because OD is not conducted during or prior to rain. No material is stored in the OD area; after OD the only remaining material, shrapnel, is visually inspected to make certain it does not contain any UXO. If UXO is found, the material is retreated.

12.3.e. Standard Operating Procedures (SOPs) [UAC R315-3-6.8(a)(2)]

OD operations are conducted in accordance with TEAD SOP (SOP No. TE-0000-G-010). This SOP is periodically reviewed and updated. The SOP will be revised, as necessary, to be commensurate with conditions of this permit.

12.4 STATIC FIRING

Static firing of rockets and missiles is similar to open burning as only the propellant is burned and the metal from the rocket or missile is recycled. The static firing unit is located mid-way between the demolition pits and the open burn pans. Appendix D shows the static firing silos at the OB/OD Area. Treatment is accomplished by the use of six silos. Items typically treated are solid propellant rockets and missiles. No donor charges are used in static firing.

The silos are located, in two rows 40 feet apart and 20 feet between each silo, on a rebar-reinforced concrete pad 52 feet by 10 feet deep. Covers are placed over the silos when they are not in use. Prior to conducting static firing, the same meteorological conditions as for open burning must be met (Section 12.2).

Operating procedures prior to the actual static firing activity are similar to those used in open burning. Dry grass, leaves and other extraneous combustible material in amounts sufficient to spread fires are removed within a radius of 61. (200 feet) from the silos. Meteorological conditions are checked and the silos inspected before each event. Carousels designed for each rocket are prepared and lowered into the silos. Rocket motors are lowered into the carousels and secured in place. The area is then cleared of all personnel except for those needed to install the firing wire to the rocket or missile igniter. When the area is determined to be clear, the rocket motors are electrically ignited from a safe position.

Fire fighting equipment is available to combat grass, brush or equipment fires. Qualified personnel check the silos to ensure that all of the propellant has been burned.

Demil personnel operate the Static Fire Area in accordance with SOP no. TE-0000-J-168. This SOP provides additional information on current operating procedures.

APPENDIX A
GENERAL SITE MAP

APPENDIX B
TOPOGRAPHIC AND STORM DRAINAGE MAPS

APPENDIX C
DETAILED BURN PAN DRAWINGS

APPENDIX D
STATIC FIRE SILOS DRAWINGS

APPENDIX E
DETONATION PITS DRAWINGS